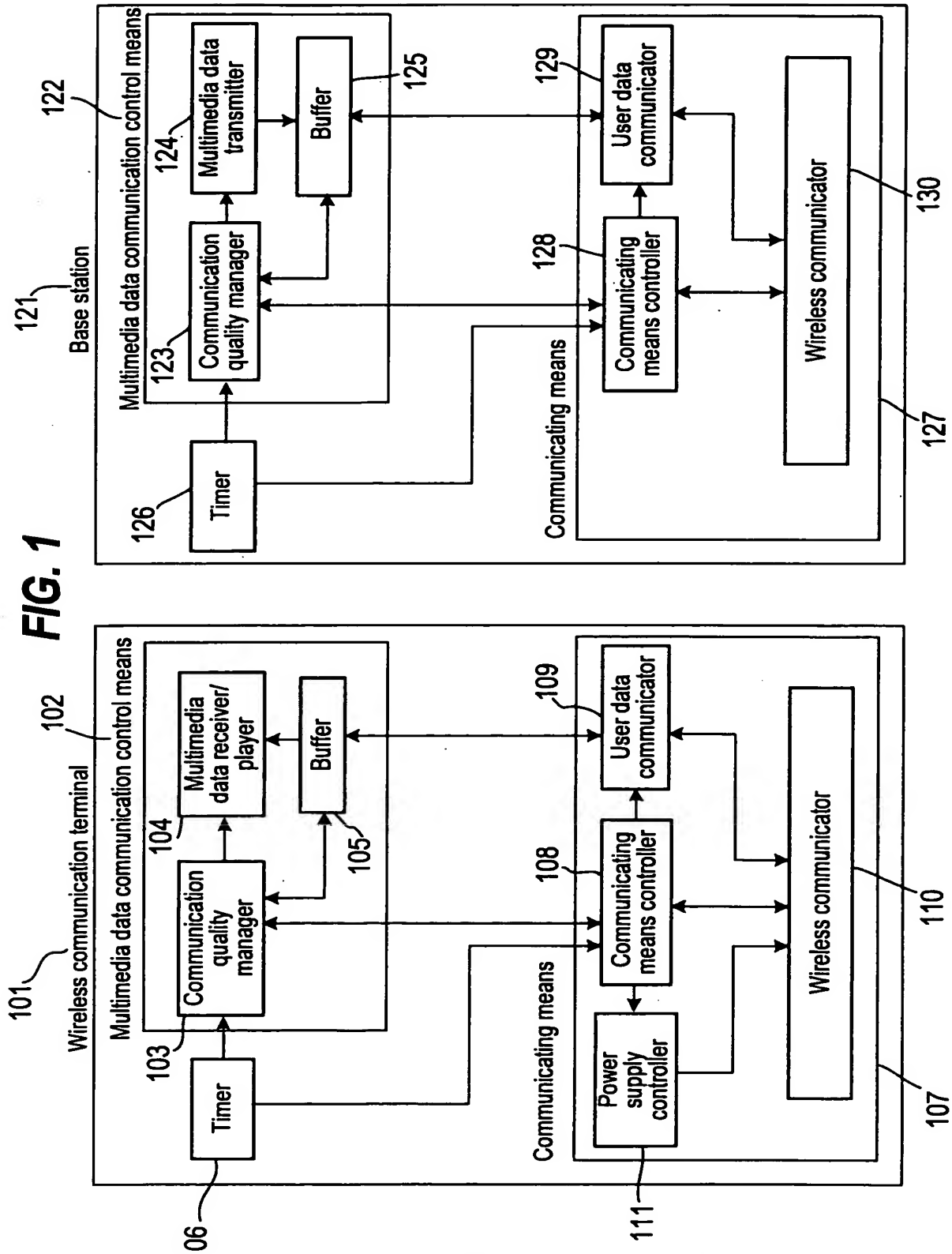

Wireless communication terminal
101
Multimedia data communication control means
102
Communication quality manager
103
Multimedia data receiver/ player
104
Buffer
105
Timer
106
Wireless communicator
107
Communicating means
Communicating means controller
108
User data communicator
109
Power supply controller
111
Wireless communicator
110
Base station
121
Multimedia data communication control means
122
Communication quality manager
123
Multimedia data transmitter
124
Buffer
125
Timer
126
Wireless communicator
127
Communicating means
Communicating means controller
128
User data communicator
129
Wireless communicator
130

FIG. 1

FIG. 2

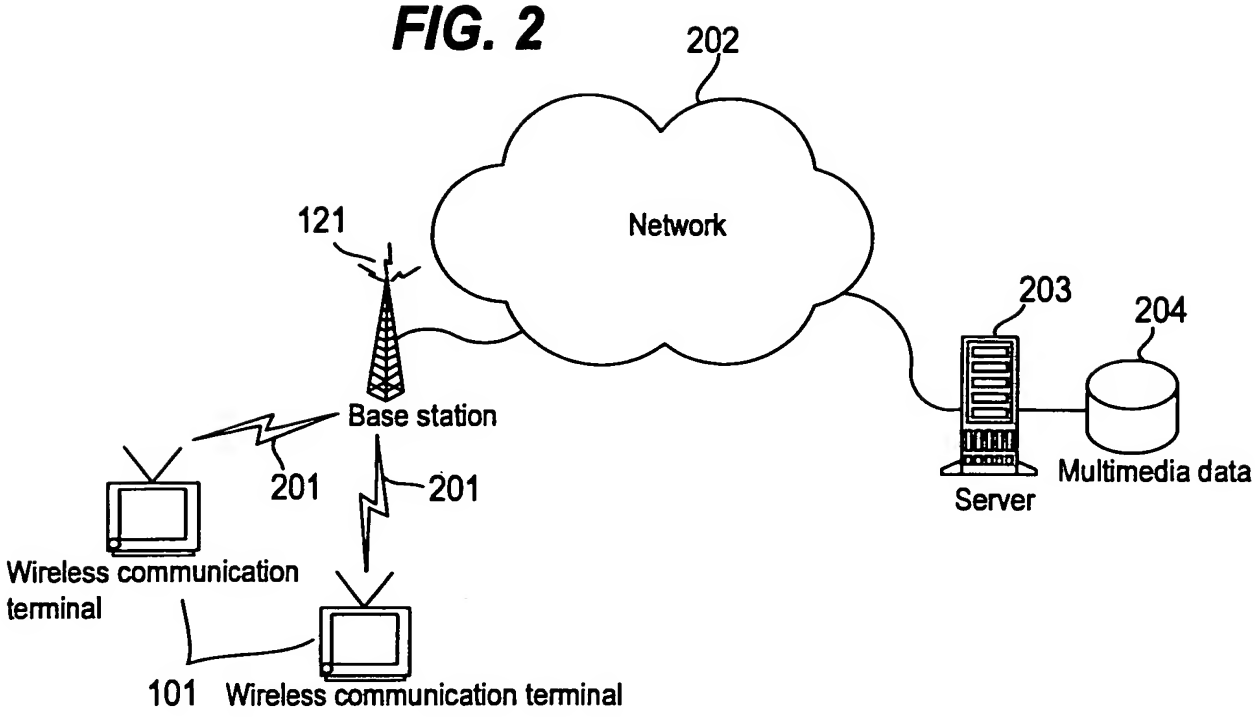


FIG. 3

301 Intermittent period (msec)	302 BPSK average transmission rate (Kbps)	303 QPSK average transmission rate (Kbps)	304 16QAM average transmission rate (Kbps)
2	6144.0	12288.0	27648.0
4	3072.0	6144.0	13824.0
8	1536.0	3072.0	6912.0
16	768.0	1536.0	3456.0
32	384.0	768.0	1728.0
64	192.0	384.0	864.0
128	96.0	192.0	432.0
256	48.0	96.0	216.0
512	24.0	48.0	108.0
1024	12.0	24.0	54.0
2048	6.0	12.0	27.0
4096	3.0	6.0	13.5
8192	1.5	3.0	6.8
16384	0.8	1.5	3.4
32768	0.4	0.8	1.7
65536	0.2	0.4	0.8

FIG. 4

401 Frame No. i	402 Start time t i (msec)	403 Data quantity Ci (byte)	404 Total amount of data required to be obtained by t i (byte)	405 Total amount of data receivable by t i+1 (byte)
1	0	270	396	32,768
2	2,000	126	516	33,038
3	5,000	120	2,517	33,164
4	6,000	2,001	8,607	33,284
5	7,000	6,090	11,727	35,285
6	7,250	3,120	13,080	41,375
7	7,500	1,353	14,433	44,495
8	7,750	1,353	15,786	45,848
9	8,000	1,353	16,359	47,201
10	8,500	573	16,932	48,554
11	8,750	573	18,285	49,127
12	9,250	1,353	18,552	49,700
13	14,250	267	19,434	51,053
14	16,250	882	21,036	51,320
15	17,250	1,602	27,045	52,202
16	17,750	6,009	28,371	53,804
17	18,750	1,326	29,691	59,813
18	19,750	1,320	30,714	61,139
19	20,250	1,023	31,434	62,459
20	20,750	720	31,434	63,482
:	:	:	:	:

FIG. 5

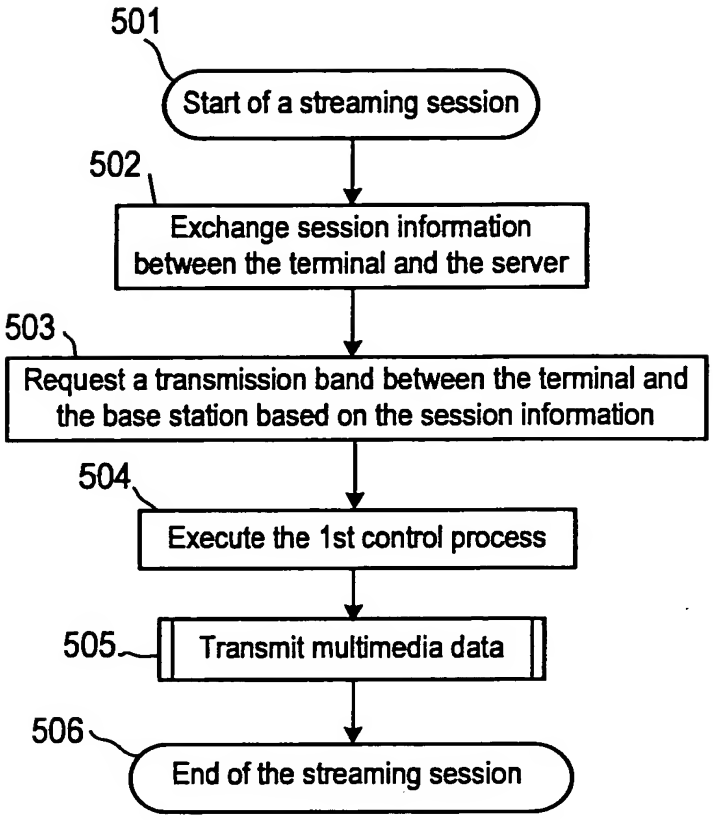

501
Start of a streaming session
502
Exchange session information between the terminal and the server
503
Request a transmission band between the terminal and the base station based on the session information
504
Execute the 1st control process
505
Transmit multimedia data
506
End of the streaming session

FIG. 6

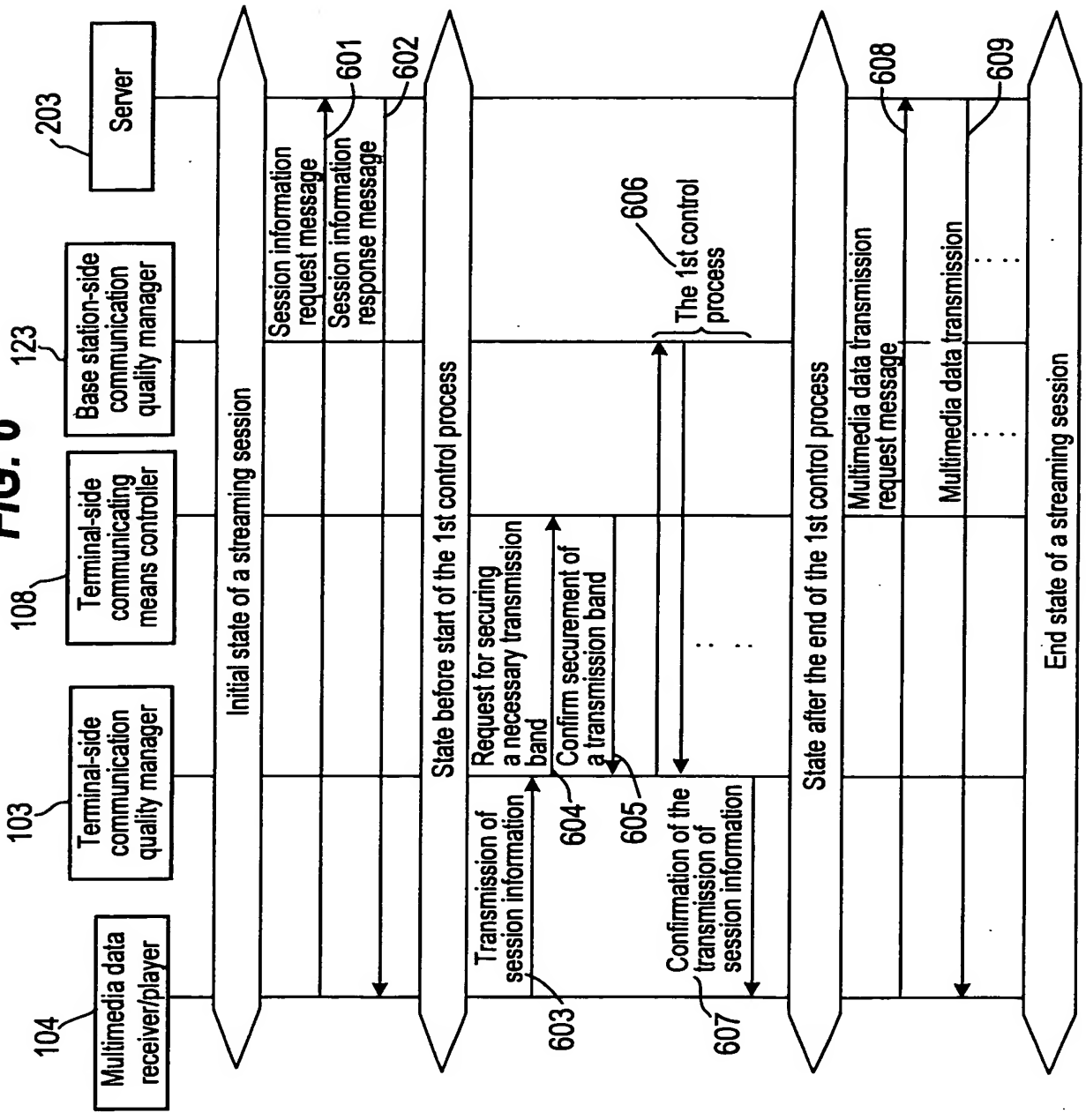

Multimedia data receiver/player
104
Terminal-side communication quality manager
103
Terminal-side communicating means controller
108
Base station-side communication quality manager
123
Server
203
Initial state of a streaming session
Session information request message
601
Session information response message
602
State before start of the 1st control process
Request for securing a necessary transmission band
Transmission of session information
603
Confirm securement of a transmission band
604
605
The 1st control process
606
Confirmation of the transmission of session information
607
State after the end of the 1st control process
Multimedia data transmission request message
608
Multimedia data transmission
609
End state of a streaming session

FIG. 7

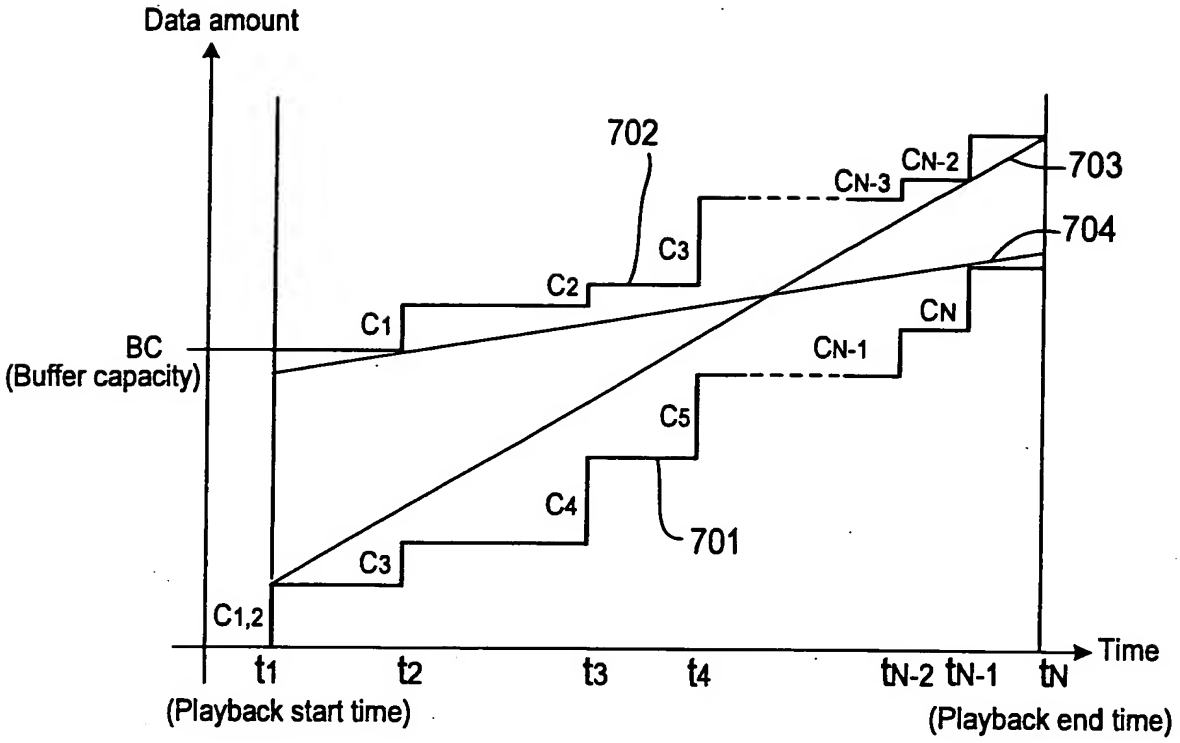

Data amount
BC
(Buffer capacity)
C1,2
C1
C2
C3
C4
C5
CN-3
CN-2
CN-1
CN
702
703
704
701
t1
t2
t3
t4
tN-2
tN-1
tN
Time
(Playback start time)
(Playback end time)

FIG. 8

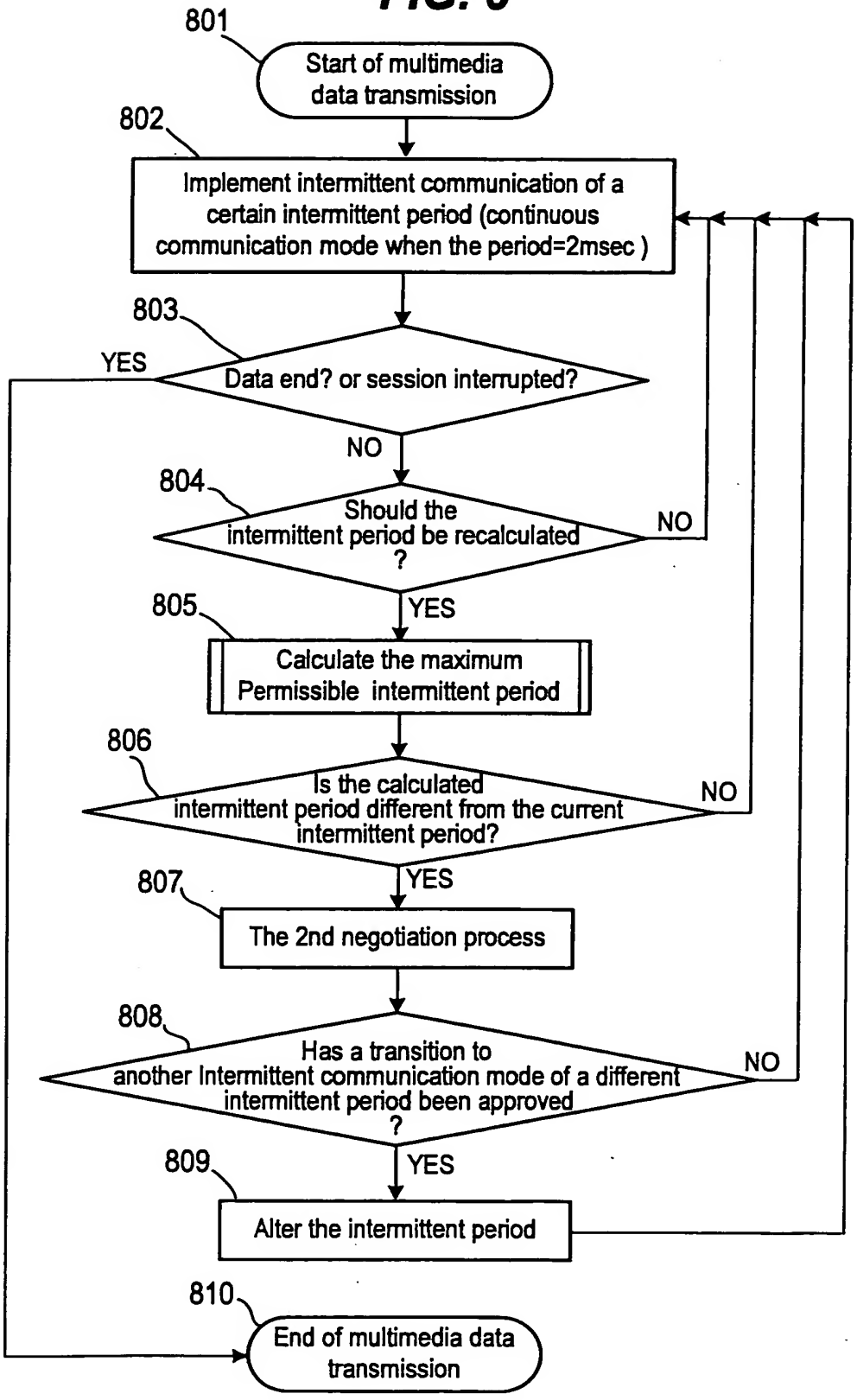

801
Start of multimedia data transmission
802
Implement intermittent communication of a certain intermittent period (continuous communication mode when the period=2msec)
803
Data end? or session interrupted?
YES
NO
804
Should the intermittent period be recalculated ?
NO
YES
805
Calculate the maximum Permissible intermittent period
806
Is the calculated intermittent period different from the current intermittent period?
NO
YES
807
The 2nd negotiation process
808
Has a transition to another Intermittent communication mode of a different intermittent period been approved ?
NO
YES
809
Alter the intermittent period
810
End of multimedia data transmission

FIG. 9

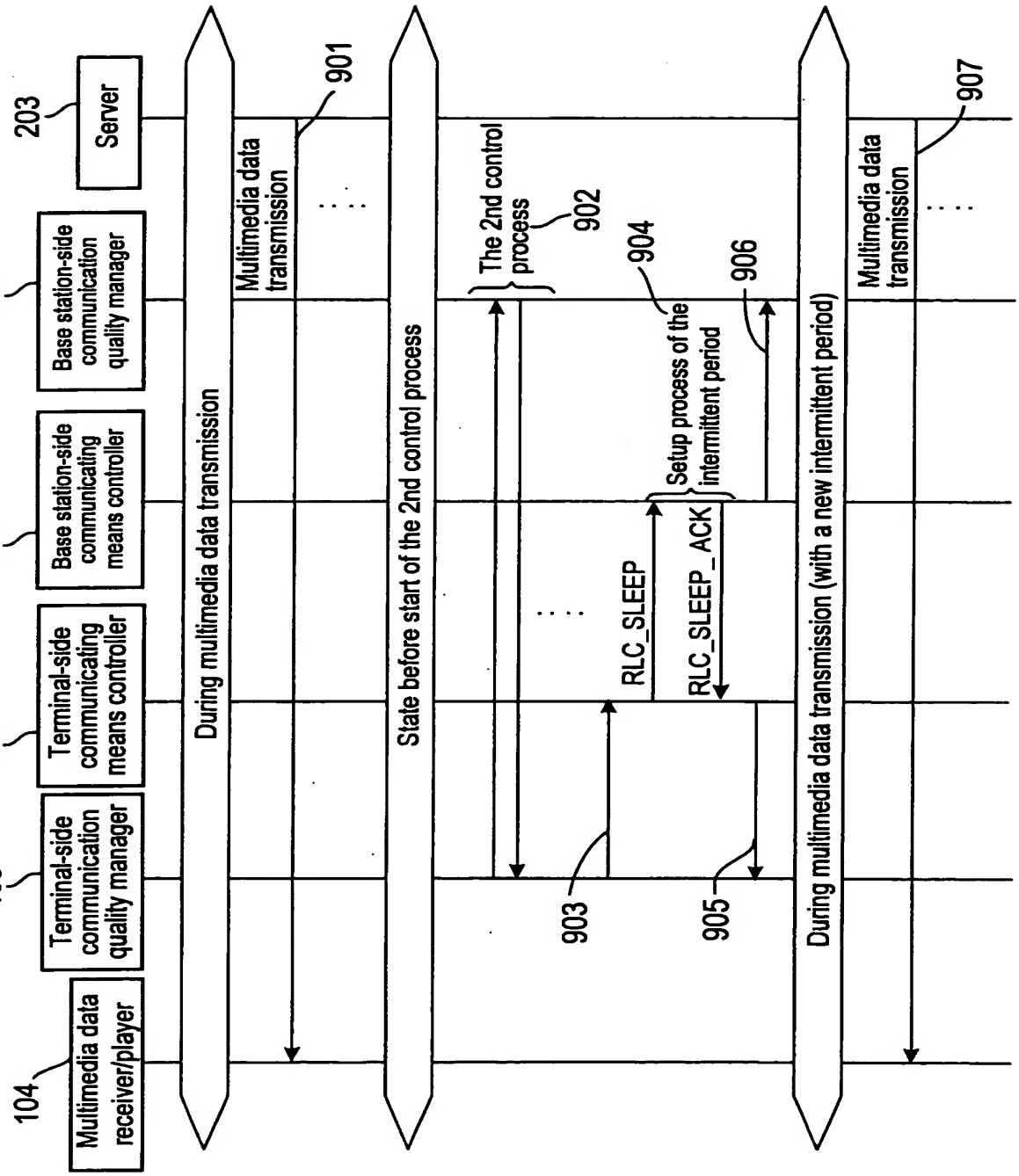

104
Multimedia data receiver/player
103
Terminal-side communication quality manager
108
Terminal-side communicating means controller
128
Base station-side communicating means controller
123
Base station-side communication quality manager
203
Server
During multimedia data transmission
Multimedia data transmission
901
State before start of the 2nd control process
The 2nd control process
902
RLC_SLEEP
903
Setup process of the intermittent period
904
RLC_SLEEP_ACK
905
906
During multimedia data transmission (with a new intermittent period)
Multimedia data transmission
907

FIG. 10

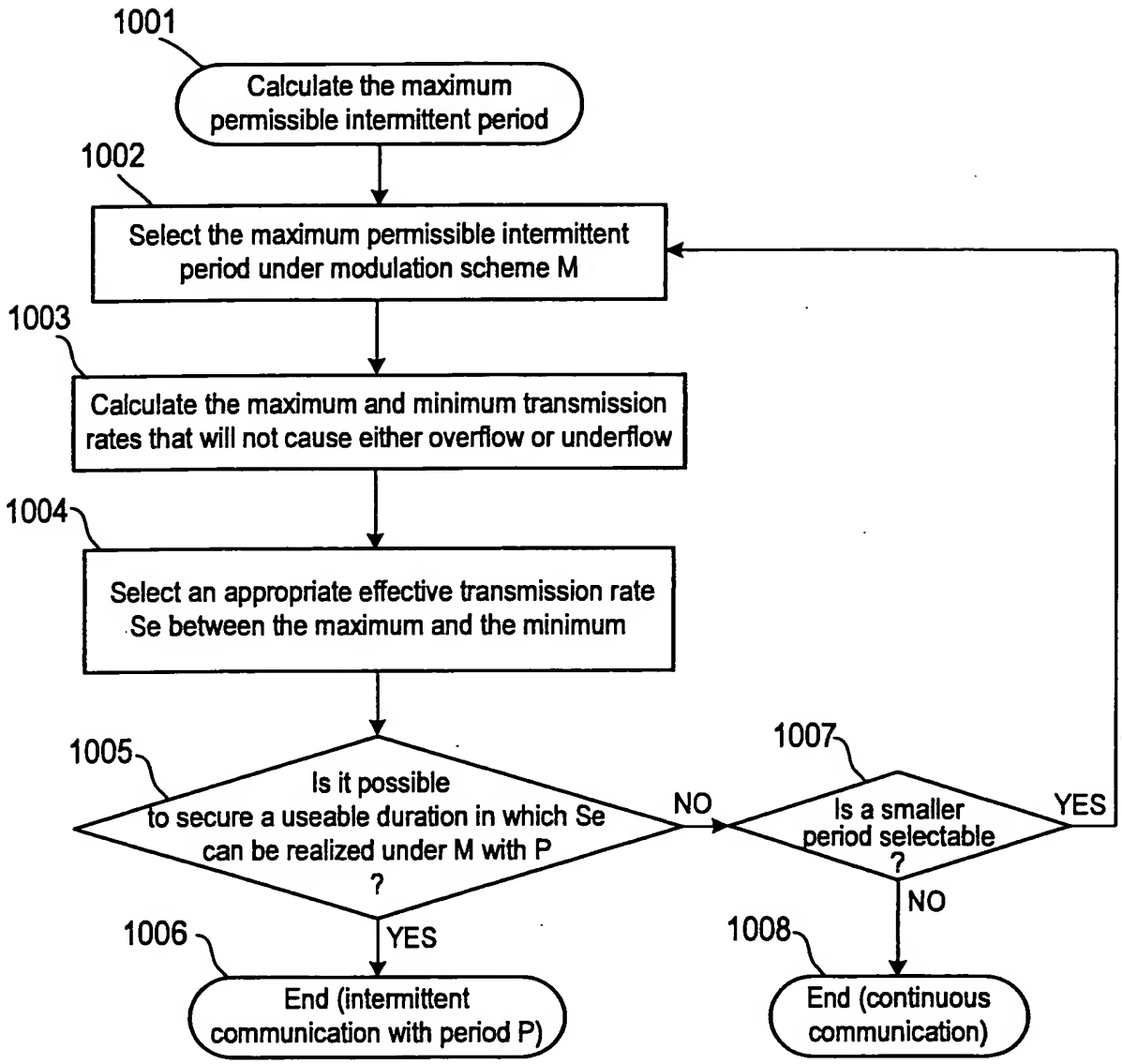

1001
Calculate the maximum permissible intermittent period
1002
Select the maximum permissible intermittent period under modulation scheme M
1003
Calculate the maximum and minimum transmission rates that will not cause either overflow or underflow
1004
Select an appropriate effective transmission rate Se between the maximum and the minimum
1005
Is it possible to secure a useable duration in which Se can be realized under M with P ?
NO
YES
1006
End (intermittent communication with period P)
1007
Is a smaller period selectable ?
YES
NO
1008
End (continuous communication)

FIG. 11

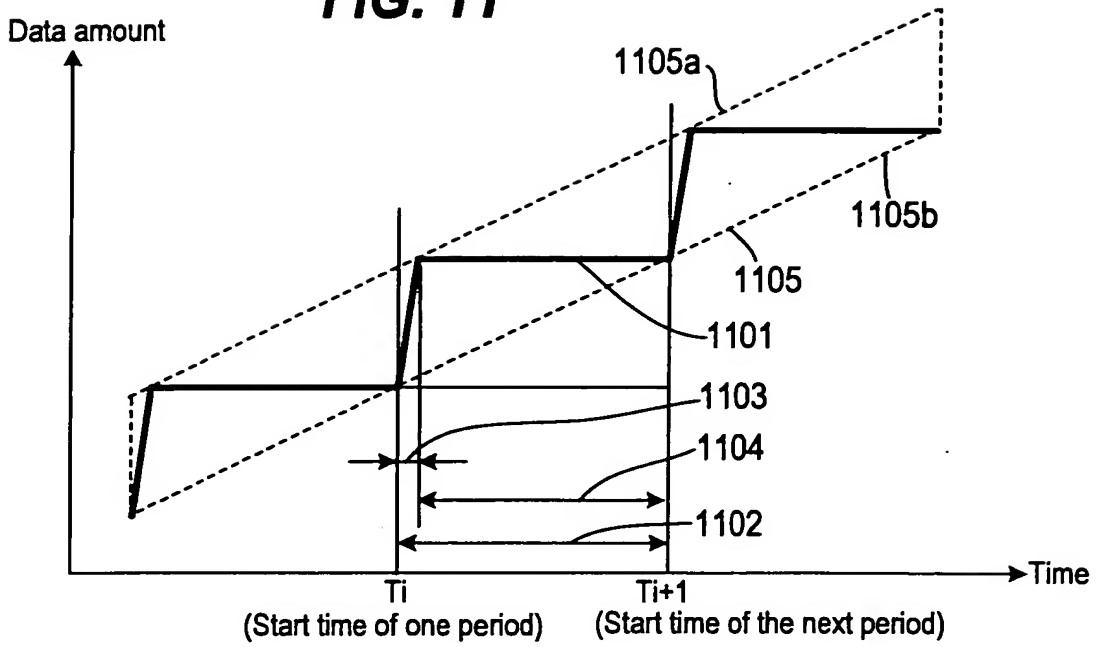

Data amount
1105a
1105b
1105
1101
1103
1104
1102
Time
Ti
(Start time of one period)
Ti+1
(Start time of the next period)

FIG. 12

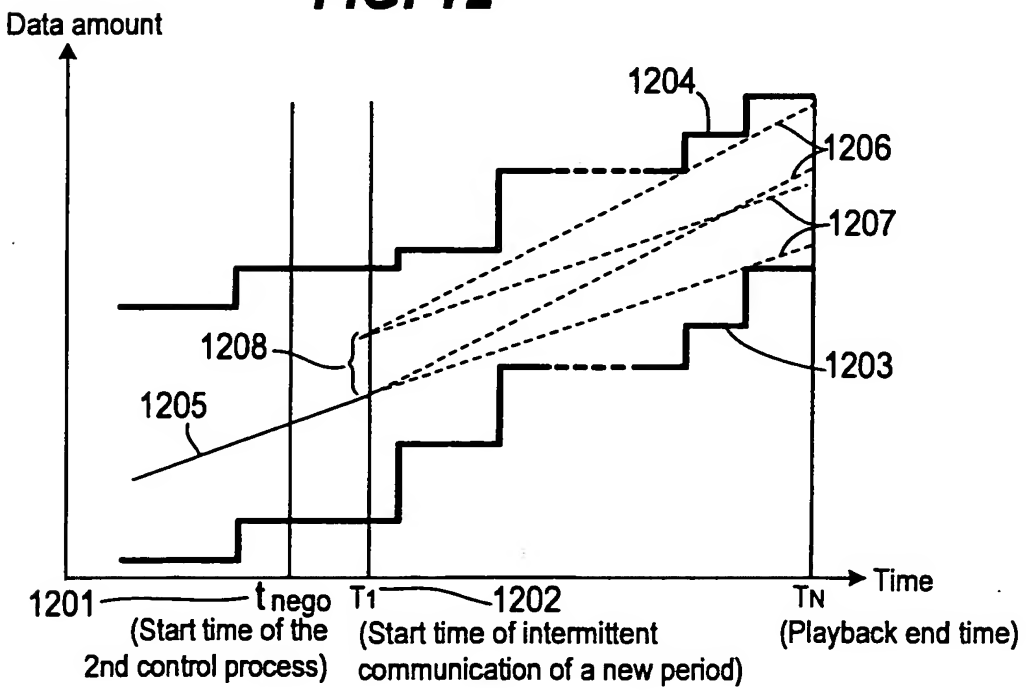

Data amount
1204
1206
1207
1208
1203
1205
Time
1201
t nego
(Start time of the 2nd control process)
T1
1202
(Start time of intermittent communication of a new period)
TN
(Playback end time)

FIG. 13

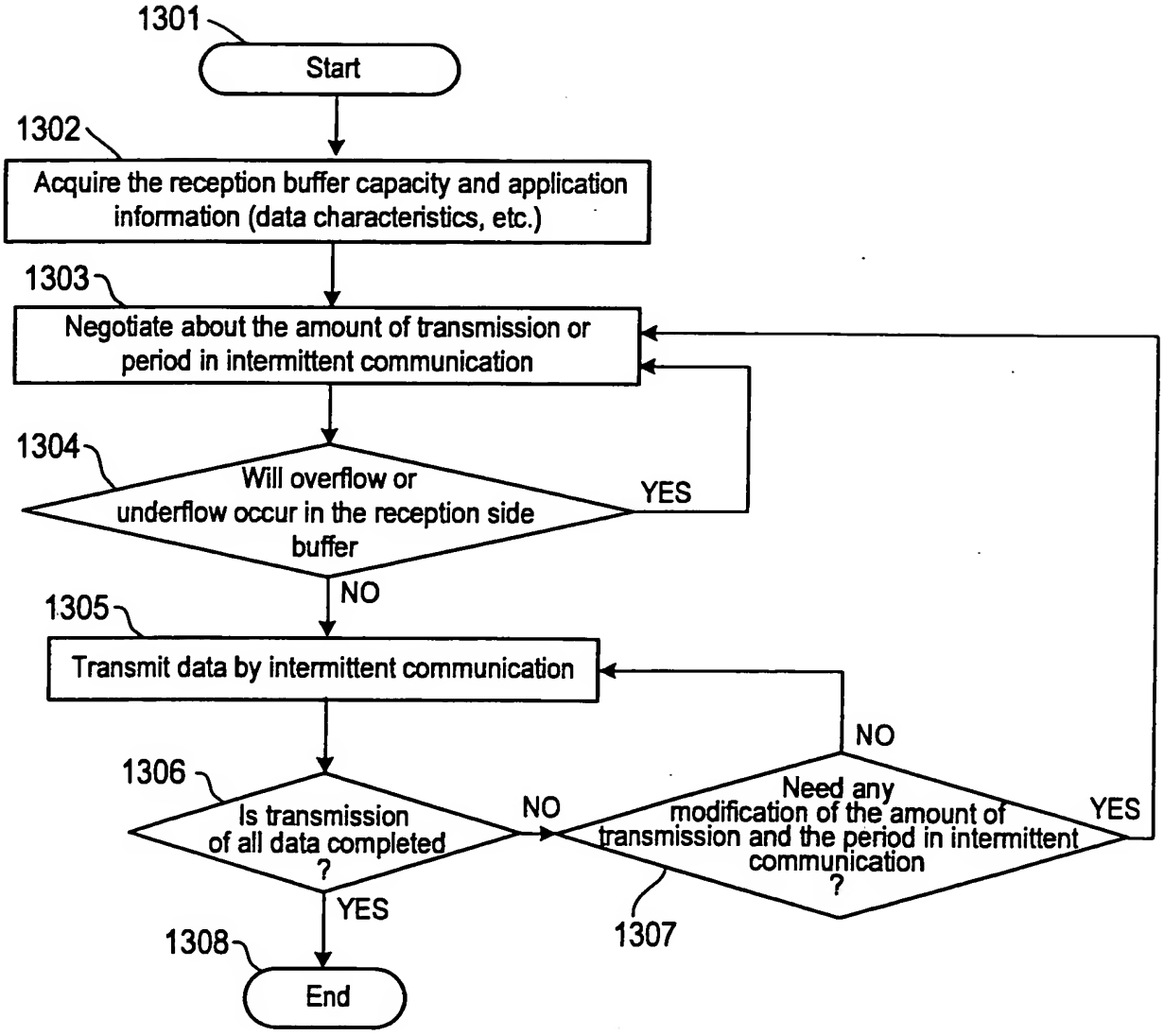
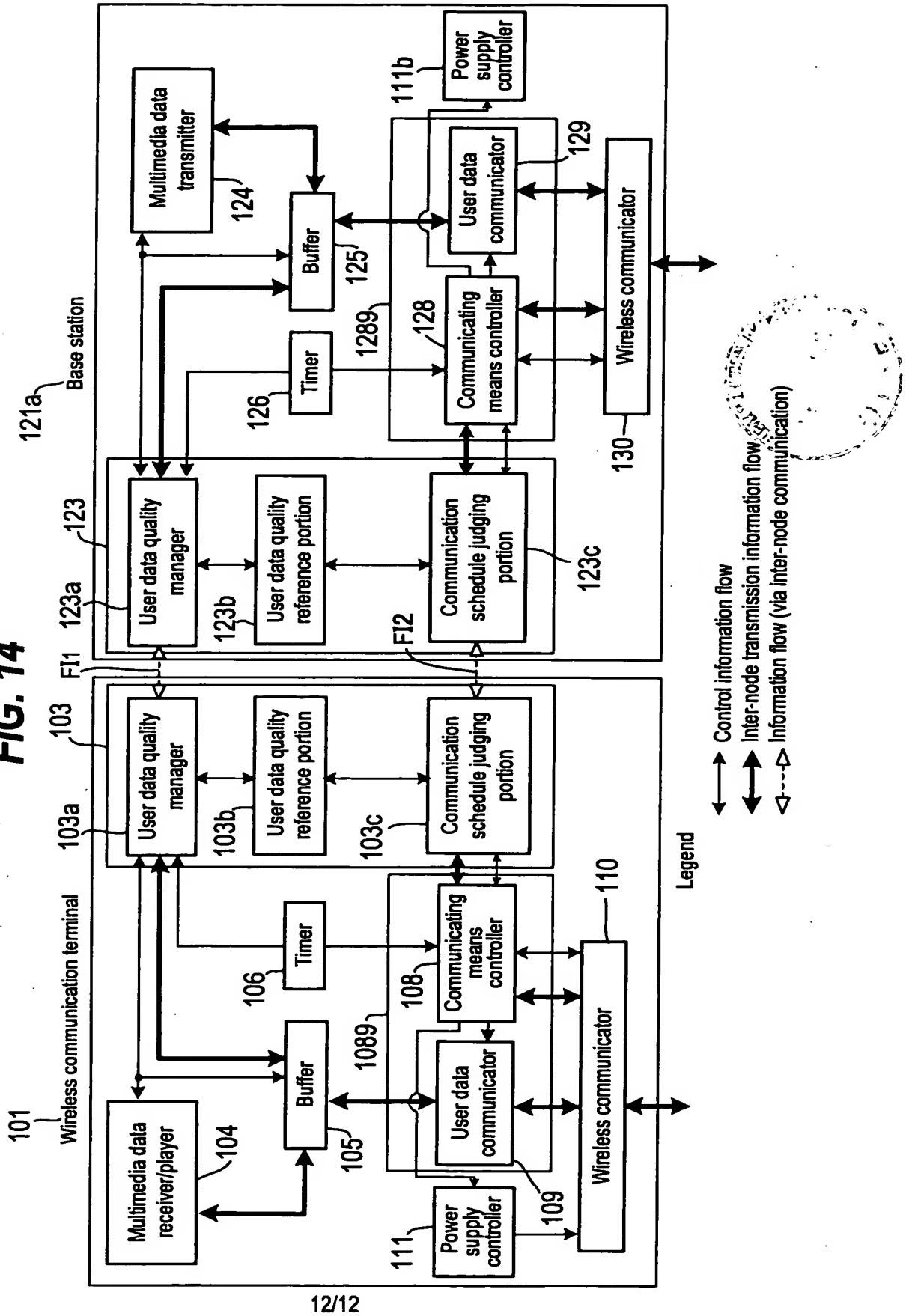

1301
Start
1302
Acquire the reception buffer capacity and application information (data characteristics, etc.)
1303
Negotiate about the amount of transmission or period in intermittent communication
1304
Will overflow or underflow occur in the reception side buffer
YES
NO
1305
Transmit data by intermittent communication
1306
Is transmission of all data completed ?
NO
YES
1307
Need any modification of the amount of transmission and the period in intermittent communication ?
NO
YES
1308
End

FIG. 14


101
Wireless communication terminal
Multimedia data receiver/player
104
Buffer
105
Timer
106
1089
Communicating means controller
108
User data communicator
109
Power supply controller
111
Wireless communicator
110
103
User data quality manager
103a
User data quality reference portion
103b
Communication schedule judging portion
103c
FI1
FI2
121a
Base station
Multimedia data transmitter
124
Buffer
125
Timer
126
1289
Communicating means controller
128
User data communicator
129
Power supply controller
111b
Wireless communicator
130
123
User data quality manager
123a
User data quality reference portion
123b
Communication schedule judging portion
123c
Legend
Control information flow
Inter-node transmission information flow
Information flow (via inter-node communication)